the discussion section of this report. The mean error rate for the IMED 927 in the decreased magnetic resonance imaging field is identified as 2.3%; however, if one takes the individual error rates and known number of devices from the results section at 9 to 12 G, the actual mean error rate is 1.8%. The error rate is 2.3% only for devices at 10 to 12 G, as is correctly stated in the results section.

Although the use of nuclear magnetic resonance imaging is certainly on the increase and this study attempts to answer a clinically relevant question, the limitations of the study methodology invalidate the comparative accuracy findings. The single largest methodologic deficiency is the use of a measurement means with an inherent error rate in the same range as the accuracy of device performance. The knowledge of failure of the IMED 927 devices under the influence of intense magnetism is useful; however, the additional study findings need to be substantiated or nullified through appropriate testing including a gravimetric volume measurement and a range of clinically relevant infusion solutions.

RICHARD E. CRASS, PharmD
Pharmacy Services Coordinator
Clinical Services, IMED Corporation
9925 Carroll Canyon Road
San Diego, CA 92131-1192

REFERENCES

1. Engler MB, Engler MM: The effects of magnetic resonance imaging on intravenous infusion devices (Clinical Investigation). West J Med 1985 Sep; 143:329-332
2. Infusion pumps (Evaluation). Health Devices 1983; 12:31-62

* * *

Mary B. Engler Responds

TO THE EDITOR: The primary focus of our article entitled "The Effects of Magnetic Resonance Imaging on Intravenous Infusion Devices" was to investigate the possibility that magnetic field interaction with intravenous (IV) devices might result in inaccurate fluid delivery to a patient. Our main study results indicated that the six IMED 927 devices completely failed to deliver fluid within the close magnetic resonance (MR) imaging field. The sample size of three IMED 960/965 and four IVAC 530 devices was determined adequate for the study to ascertain proper fluid accuracy of these devices in the MR imaging area. A larger sample size of these devices was not feasible due to device availability and logistics of device positioning in the MR imaging field.

The reported "measurement error associated with disposable syringes is at least 3% to 5%" is not valid related to the study results since fast rate collections were obtained using graduated cylinders. In fact, syringe measurements served as a method of measuring delivered volume equivalent to using graduated cylinders in our testing. Specific flow rates from the IMED devices were slow (10 ml per hour), medium (50 ml per hour) and fast (100 ml per hour). The IVAC 530 device rates were identical with exception to the fast rate at 99 ml per hour. Data were obtained in a control versus experimental magnetic environment and the reported "3% to 5% syringe error" would have been initially measured during the control, thus changes that occurred in the magnetic field would not be due to syringe error. Clearly, volume error was due to device performance affected by magnetic interaction, as vividly demonstrated with the IMED 927, and not measurement error.

The IVAC 530 devices were $\pm 3.3\%$ prescribed fluid accuracy in the control environment, which exceeds the manufacturer's specifications $\pm 2\%$. No aberration in IVAC 530 flow rates occurred in the magnetic environment, and thus no statistically significant difference was detected between the control and magnetic field exposure for these devices. All devices, including the IMED pumps, had initial calibration levels determined before the study and the results of all devices were calculated by the same statistical means without bias.

The inclusion of multiple viscosity IV fluids and additives was not within the scope of this study as previously stated in the article. Additionally, despite ECRI's $\pm 5\%$ standard for delivery volume accuracy in their device testing, the IMED 960/965 devices' range of error was 1% to 4% and the devices were significantly affected ($P = .02$) by close magnetic interaction. This range of error poses definite clinical implications for a critically ill patient receiving life-sustaining IV medications or for a pediatric patient, when fluid accuracy is essential.

The inferences related to limitations of the study methodology are unsubstantiated. The inaccuracy of potential fluid or medication delivery induced by magnetic interactions cannot be minimized. Device performance is compromised with the IMED devices and failure can occur in the magnetic environment. Future MR imaging capabilities with increased magnetic field strengths must also be considered related to the effect on IV device performance. Therefore, in view of the magnetic effects on intravenous device performance recognized in our study, necessary precautions must be taken to safeguard the patient in this environment. We hope our study has stimulated further research, and perhaps a full-scale investigation including a larger sample size utilizing several IV device types, multiple viscosity intravenous solutions and additives will be conducted in the near future as a result.

MARY B. ENGLER, RN, MS
Critical Care Nursing Service
Cardiac Surgery Branch, NHLBI
National Institutes of Health
Building 10, Room 7D50
Bethesda, MD 20892

Evaluating Enlarged Cervical Nodes

TO THE EDITOR: The brief review on evaluating peripheral lymphadenopathy in adult patients by Kunitz[1] requires some clarification and amplification. We believe that the author's recommendation for an early biopsy of a cervical node is potentially dangerous.

In a retrospective review, McGuirt and McCabe[2] analyzed the outcome in patients who had biopsies of cancer-filled neck nodes. The incidence of wound infection and local and distant disease was higher in the group that underwent biopsies than in the group undergoing en-bloc resection.

If cancer is suspected in an enlarged cervical node in an elderly patient, the current preferred sequence of evaluation includes the following:

- a fine-needle aspiration of the mass[3];
- endoscopy of the upper aerodigestive tract including direct laryngoscopy, esophagoscopy, bronchoscopy;
- an open biopsy of the mass preparing the patient for a possible en-bloc cervical node dissection.

The technique of cytological evaluation of neck masses has a false negative rate for malignancy of 0% to 6% and a greater than 95% rate of true positives.[3] Since the majority of neck masses harboring cancer originate from a primary tumor